

All Shook up - Rock Shake

LP: _____ Date: _____

Which do you think would weather faster, a rock attacked by plant acids or a rock in the rushing waters of a stream? Many factors affect the rate at which rock weathers. In this lab, you will compare the rates of weathering that take place under different conditions.

Problem: How will shaking and acidic conditions affect the rate at which limestone weathers?

Hypothesis: Write your educated guess on your yellow lab sheet. It should discuss which will affect weathering rates more - chemical weathering (acidic conditions) or mechanical weathering (shaking)

Materials:

- Water
- Triple beam balance
- Paper towels
- Masking tape
- 2 pieces of thin cloth
- Marking pen or pencil
- Vinegar (an acid)
- Plastic graduated cylinder (250mL)
- 80 small pieces of water-soaked limestone
- 4 watertight plastic containers with screw on caps (500mL)

Procedure:

Part 1 - Day 1

1. Get 4 containers (they should already be labeled A, B, C, and D)
2. Place a colored dot on each container with your table letter and period)
3. Separate the 80 pieces of limestone into four sets of 20.
4. Find the mass of the 1st set of limestone and record their mass in data table 1. Place these rocks in container A.
5. Repeat step 3 with the other sets of limestone and place them in containers B, C, and D.
6. Pour 150 mL of water into container A and B. Put caps on both containers.
7. Pour 150 mL of vinegar into container C and D. Put caps on both containers.
8. Allow the pieces to soak overnight.

Part 2 - Day 2

9. Screw the caps tightly on containers B and D. Shake both containers for 10 to 15 minutes. Make sure the container is shaken for exactly the same amount of time

and at the same intensity. After shaking, set the containers aside. **Do not shake containers A and C.**

10. Open the top of container A. Place one piece of thin cloth over the opening of the container. Carefully pour all of the water out through the cloth into a waste container. Be careful not to let any of the pieces flow out with the water. **DRY** these pieces carefully and record their mass in the data table.
11. Determine how much limestone was lost through weathering in container A. (Hint: Subtract the mass of the limestone pieces on Day 1 from the mass of the remaining pieces on Day 2.) Record information in Data table.
12. Repeat steps 10 and 11 for containers B, C, and D.
13. Calculate the percent change in mass of the 20 pieces of each container:

Percent change =

(Change in mass X 100) divided by (Total mass start)

Data:

Container	Total Mass Start	Total Mass Next Day	Change in Mass	Percent Change in Mass
A (Water, no shaking)				
B (Water, shaking)				
C (Vinegar, no shaking)				
D (Vinegar, shaking)				



Analysis:

1. Make a bar graph that shows the Percent change in mass of the limestone.
2. Does your data show a change in the mass of the 20 pieces for each of the four containers? _____
3. Which container had the greatest change in mass? _____
4. Why do you think that container had the greatest change in mass? _____

5. Based on your data, which variable do you think was more responsible for breaking down the limestone: the vinegar or shaking? _____

Conclusion: Write your conclusion on your yellow lab sheet.



